IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Henry DaCosta et al
Application No.	:	10/723,778
For	:	**Systems and Methods for Adaptive Interpretation of Input from a Touch-Sensitive Input Device**
Filed	:	November 26, 2003
Examiner	:	Regina Liang
Art Unit	:	2629

Mail Stop Appeal Brief – Patents
Commissioner for Patents
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APPEAL BRIEF

Sir:

This is an Appeal Brief filed under 37 C.F.R. § 41.37 in connection with the final rejection of claims 1-13, 16-23, and 26-32 in the Final Office Action mailed September 24, 2008. Each of the topics required by 37 C.F.R. § 41.37 is presented herewith and labeled appropriately.

Real Party in Interest

The real party in interest in the present application is the assignee, Immersion Corporation, 801 Fox Lane, San Jose, California 95131 (hereinafter "Appellant").

Related Appeals and Interferences

Appellant and the Appellant's legal representative know of no appeals or interferences that will directly affect, will be directly affected by, or have a bearing on the Board's decision in this appeal.

Status of Claims

Claims 1-5, 7-13, 16-20, 21-23, and 26-32 (listed in Appendix A) stand finally rejected and are the substance of this appeal. The final rejection of claims 1-5, 7-13, 16-20, 21-23, and 26-32 is appealed.

Status of Amendments

Applicant cancelled claims 6 and 20 in the response to Final Office Action filed November 21, 2008. Applicant submitted an amendment after filing the Notice of Appeal, but before the filing of this Appeal Brief to make a minor amendment to claim 19 to insert the obviously omitted phrase "program code for."

Summary of the Claimed Subject Matter

The present application has two pending independent claims – claims 1 and 19 – that are generally directed to methods and apparatuses for determining a user's intent when using a touch-sensitive interface. For example, it may be desirable to determine when a user is attempting to indicate a press of a virtual button displayed on the screen or to move a cursor across the screen. See Specification, e.g., paragraphs 5 and 6.

Claim 1 is a method claim comprising four elements. The first element recites "receiving a pressure signal indicating a pressure from an input device." For example, the specification discloses that a touchpad may detect a pressure of a contact on the touchpad, such as from a user's finger. See Specification, e.g., paragraph 10. In such an embodiment, the touchpad may transmit the pressure signal to a processor, where the pressure signal indicates a pressure on the touchpad. See Specification, e.g. paragraph 17. The indicated pressure may be a pressure or a pseudo-pressure. See Specification, e.g., paragraph 14.

In the second element, claim 1 recites "determining a change in pressure based at least in part on the pressure signal." For example, in one embodiment, a change in pseudo pressure may be computed by subtracting the filtered (average) pseudo pressure from the current pseudo pressure. In another embodiment, the previous filtered pseudo pressure is subtracted from the current filtered pseudo pressure. See Specification, e.g., paragraph 50.

In the third element, claim 1 recites "determining a velocity associated with the pressure signal." For example, in one embodiment, the specification discloses that the velocity can be determined based on a change in X and Y position on the touchpad. In such an embodiment, the speed (or velocity) is equal to the square root of the change in X position squared plus the change in Y position squared. See Specification, e.g., paragraph 41.

In the last element, claim 1 recites "outputting a press signal if the velocity is less than a velocity threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed." The specification discloses that in one embodiment the velocity is compared against a velocity threshold. See Specification, e.g., paragraph 46, Figure 3. If the velocity is less than the velocity threshold, then the change in pressure is compared against a change in pressure threshold. See Specification, e.g., paragraph 46, Figure 3. And if the change in pressure is greater than the change in pressure threshold, the processor determines whether a first interval has elapsed. See Specification, e.g., paragraph 46, Figure 3. If the first interval has elapsed, then the processor determines that a press is occurring and a press signal is output. See Specification, e.g., paragraph 46, Figure 3.

Independent claim 19 recites an apparatus: a computer-readable medium comprising programming code. In the first claim element, claim 19 recites "program code for receiving a pressure signal indicating a pressure from an input device." For example, the specification discloses that a touchpad may detect a pressure of a contact on the touchpad, such as from a user's finger. See Specification, e.g., paragraph 10. In such an embodiment, the touchpad may transmit the pressure signal to a processor, where the pressure signal indicates a pressure on the touchpad. See Specification, e.g. paragraph 17. The indicated pressure may be a pressure or a pseudo-pressure. See Specification, e.g., paragraph 14.

In the second element, claim 19 recites "program code for determining a change in pressure based at least in part on the pressure signal." For example, in one embodiment, a change in pseudo pressure may be computed by subtracting the filtered (average) pseudo pressure from the current pseudo pressure. In another embodiment, the previous filtered pseudo pressure is subtracted from the current filtered pseudo pressure. See Specification, e.g., paragraph 50.

In the third element, claim 19 recites "program code for determining a velocity associated with the pressure signal." For example, in one embodiment, the specification discloses that the

velocity can be determined based on a change in X and Y position on the touchpad. In such an embodiment, the speed (or velocity) is equal to the square root of the change in X position squared plus the change in Y position squared. See Specification, e.g., paragraph 41.

In the last element, claim 19 recites "program code for outputting a press signal if the velocity is less than a velocity threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed." The specification discloses that in one embodiment the velocity is compared against a velocity threshold. See Specification, e.g., paragraph 46, Figure 3. If the velocity is less than the velocity threshold, then the change in pressure is compared against a change in pressure threshold. See Specification, e.g., paragraph 46, Figure 3. And if the change in pressure is greater than the change in pressure threshold, the processor determines whether a first interval has elapsed. If the first interval has elapsed, then the processor determines that a press is occurring and a press signal is output. See Specification, e.g., paragraph 46, Figure 3.

Grounds of Rejection to be Reviewed on Appeal

There are five grounds of rejection to be reviewed on appeal.

1. Claims 1-13, 16-23, and 26-32 stand rejected under 35 U.S.C. § 112, ¶ 1 for allegedly failing to comply with the written description requirement.

2. Claims 1-3, 5-13, 16, 17, 19-23, 26, 27, and 29-32 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. 5,880,411 to Gillespie et al ("Gillespie") in view of U.S. Patent No. 6,590,568 to Astala et al ("Astala").

3. Claim 4 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Gillespie in view of Astala and further in view of U.S. Patent Publication No. 2003/0063073 to Geaghan et al ("Geaghan").

4. Claims 18 and 28 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Gillespie in view of Astala and further in view of U.S. Patent No. 6,118,435 to Fujita et al ("Fujita").

5. Claims 19-23, 26-28, 30, and 32 stand rejected under 35 U.S.C. § 101 as allegedly being directed towards unpatentable subject matter.

Argument

Issue 1: Whether the Examiner erred in rejecting claims 1-13, 16-23, and 26-32 under 35 U.S.C. § 112, ¶ 1.

Claims 1-13, 16-23, and 26-32 satisfy 35 U.S.C. § 110, ¶ 1 because the specification discloses a "change in pressure threshold" as recited in claims 1 and 19.

Section 112, ¶ 1 requires, in relevant part, that the specification "contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same."

Applicant has cancelled claims 6 and 20 rendering the rejection of those claims moot.

Because the specification of this application would enable one of ordinary skill in the art to make and use the invention, claims 1 and 19 satisfy § 112, ¶ 1. More specifically and contrary to the Examiner's assertions, the specification provides enabling support for a "change in pressure threshold." For example, the specification recites that "If the change in pseudo pressure is greater than the threshold, the processor (106) determines whether the first interval has elapsed 324." See Specification, paragraph 46. Further, it is disclosed that if several conditions are true, including that a change in pressure is greater than a threshold, a press signal is output. See Specification, paragraph 46. In addition, Figure 3 shows a flow chart including a decision step 222 for determining whether a change in pressure is greater than a change in pressure threshold. See Figure 3.

Based on the Examiner's rejection, there appears to be confusion over the use of the phrase in question. It should be noted that the threshold quoted above is a "change in pressure" threshold (i.e. a threshold for ΔP), which may be a constant value, rather than a pressure threshold that is changing, which appears to be the Examiner's interpretation.

For the foregoing reasons, Applicant respectfully asserts that claims 1 and 19, and consequently their dependent claims, satisfy the requirements of 35 U.S.C. § 112, ¶ 1. Consequently, claims 2-5, 7-13, 16-18, 21-23, and 26-32 satisfy 35 U.S.C. § 112, ¶ 1 because

they were rejected based on the rejection of either claim 1 or 19. Applicant requests that the Board reverse the Examiner's rejection of claims 1-13, 16-23, and 26-32 under 35 U.S.C. § 112, ¶ 1.

Issue 2: Whether the Examiner erred in rejecting claims 1-3, 5-13, 16, 17, 19-23, 26, 27, and 29-32 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Gillespie in view of Astala.

Claims 1-3, 5-13, 16, 17, 19-23, 26, 27, and 29-32 are patentable over Gillespie in view of Astala because Gillespie in view of Astala does not disclose "outputting a press signal if the velocity is less than a velocity threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed."

To reject a claim under 35 U.S.C. § 103(a) the scope and content of the references must be ascertained, the differences between the references and the claimed invention, and the level of ordinary skill in the pertinent art must be resolved. See Graham v. John Deere Co., 383 U.S. 1, 17 (1966); *See also* KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398 (2007).

Applicant has cancelled claims 6 and 20 rendering their rejection moot.

In response to Applicant's arguments presented in the previous response, the Examiner argues that Gillespie discloses "the change in pressure is greater than a change in pressure threshold" because Gillespie recites "the finger pressure increases past threshold ZpushDown, causing the virtual button to be pressed." See Office Action, p. 9. However, this does not disclose that a change in pressure is being calculated or that the calculated change in pressure is being compared against a threshold. Rather, the quoted section discloses that a pressure, not a change in pressure, is compared against the threshold in an iterative fashion until the pressure is greater than the threshold, at which time a button press occurs. Thus, Gillespie does not disclose comparing a change in pressure to a threshold, but only discloses comparing a pressure to a threshold.

Further, with respect to Astala, the Examiner responds that Astala discloses "the change in pressure is greater than a change in pressure threshold" because:

> Astala teaches "at step 710, a determination is made that the value of the pressure z of touch input 732 is greater than a predetermined value Za over the period of time t.sub.1 that the object touches the touch screen 70, that is greater than a

> predetermined time tA. That is, the pressure of the object touching the touch screen 70 is determined to be greater than a predetermined pressure value for a period of time, which is greater than a predetermined period of time," which clearly teaches outputting a press signal if the value of a **pressure of a touch input is greater than a pressure threshold** and a first time interval has elapsed.

Final Office Action mailed September 24, 2008, p. 9 (emphasis added). As can be seen in the emphasized portion of the language from the Office Action, the Examiner alleges that Astala discloses comparing a pressure to a pressure threshold. See Office Action, p. 9-10. But this is not the same as comparing a change in pressure to a threshold as recited in claim 1. Thus, Astala also fails to teach "the change in pressure is greater than a change in pressure threshold."

With respect to the Examiner's rejection, because Gillespie in view of Astala does not teach or suggest "outputting a press signal if the velocity is less than a velocity threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed" as recited in claim 1, claim 1 is patentable over the combined references. The Examiner has cited column 35 lines 28-30 and column 49, lines 8-12 to support the assertion that Gillespie teaches comparing a change in pressure to a threshold. However, these two portions of Gillespie relate to a pressure value, not a change in pressure value:

> Finally, the Z signal exceeds threshold Ztap for at least some part of the stroke. Thus the stroke qualifies as a tap.

Gillespie, Col. 35, lines 28-30.

> FIG. 19 is a timing diagram illustrating a "push" gesture. To perform this gesture, the finger is first brought near enough to cause cursor motion without causing a virtual button press. Next, the finger pressure increases past threshold ZpushDown, causing the virtual button to be pressed.

Gillespie, Col. 49, lines 8-12.

Each of these passages describes comparing a "pressure" with a threshold, not a "change in pressure" with a "change in pressure" threshold. As such, Gillespie does not teach or suggest "outputting a press signal if the velocity is less than a velocity threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed." Astala does not cure this deficiency. Astala teaches a method for dragging a virtual object across a touch screen by dragging a finger across the touch screen. The portion cited by the Examiner does not relate

to detecting a press event. Instead it relates to the detection of the drag gesture. The detection of a press is dealt with summarily:

> The process begins at step 700. At step 702, a touch screen input is detected. That is, the touch of an object, such as a finger or pointed stylus, on the touch screen 70 is detected. This is illustrated in FIG. 6b by touch input 732 being disposed over the object file 1 of window 728.

Astala, Col. 9, lines 15-19.

Thus, neither Astala, nor Gillespie in view of Astala, teach or suggest "outputting a press signal if the velocity is less than a velocity threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed" as recited in claim 1. As such, claim 1 is patentable over Gillespie in view of Astala. Applicant respectfully requests the Board reverse the Examiner's the rejection of claim 1.

Similar to claim 1, claim 19 recites "program code for outputting a press signal if the velocity is less than the velocity threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed." Claim 19 is patentable over Gillespie in view of Astala for at least the same reasons as claim 1. Applicant respectfully requests the Board reverse the Examiner's the rejection of claim 19.

Because claims 2-3, 5, 7-13, 16, 17, 21-23, 26, 27, and 29-32 each depend from and further limit either claim 1 or claim 19, claims 2-3, 5, 7-13, 16, 17, 21-23, 26, 27, and 29-32 are each patentable over Gillespie in view of Astala for at least the same reasons. Applicant respectfully requests the Board reverse the Examiner's rejection of claims 2-3, 5, 7-13, 16, 17, 21-23, 26, 27, and 29-32.

Issue 3: Whether the Examiner erred in rejecting claim 4 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Gillespie in view of Astala and Geaghan.

Claim 4 is patentable over Gillespie in view of Astala and further in view of Geaghan because Gillespie in view of Astala and Geaghan does not disclose "outputting a press signal if the velocity is less than a velocity threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed."

To reject a claim under 35 U.S.C. § 103(a) the scope and content of the references must be ascertained, the differences between the references and the claimed invention, and the level of

ordinary skill in the pertinent art must be resolved. See Graham v. John Deere Co., 383 U.S. 1, 17 (1966); *See also* KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398 (2007).

As discussed above, Gillespie in view of Astala does not teach or suggest "outputting a press signal if the velocity is less than a velocity threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed." Geaghan does not cure this deficiency. Geaghan teaches that a change in pressure should be **less than** a threshold to detect a valid press event, not that a change in pressure should be greater than a threshold as recited in claim 1. See Geaghan, Figure 1. Further, Geaghan states that if the rate of change of pressure is greater than a threshold, it "can indicate a double touch or an unstable touch. If the touch is stable and the rate of change is less than a threshold, a position can be reported." Geaghan, Paragraph 50. As such, Geaghan teaches that a change in pressure greater than a threshold is undesirable when detecting a touch, contrary to elements recited in claim 4. Thus, claim 4 is patentable over the combined references. Applicant respectfully requests the Board reverse the Examiner's rejection of claim 4.

Issue 4: Whether the Examiner erred in rejecting claims 18 and 28 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Gillespie in view of Astala and Fujita

Claims 18 and 28 are patentable over Gillespie in view of Astala and further in view of Fujita because Gillespie in view of Astala and Fujita does not disclose "outputting a press signal if the velocity is less than a velocity threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed."

To reject a claim under 35 U.S.C. § 103(a) the scope and content of the references must be ascertained, the differences between the references and the claimed invention, and the level of ordinary skill in the pertinent art must be resolved. See Graham v. John Deere Co., 383 U.S. 1, 17 (1966); *See also* KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398 (2007).

As discussed above, Gillespie in view of Astala does not teach or suggest "outputting a press signal if the velocity is less than a velocity threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed." Fujita does not cure this deficiency.

Fujita generally teaches a touch panel with tactile feedback. However, Fujita teaches that detection of a press is made as follows:

> Within the case 1, a press detection switch 6 is provided between the touch panel 3 and the touch-panel support plate 4 therebelow for detection of a press on the touch panel 3 at a pressure greater than a predetermined level Pt and for output of a press detection signal SS (see FIG. 2). The press detection switch 6 constitutes the press detecting means. The predetermined pressure Pt in this case means a pressure such as to cause the press detection switch 6 to output the press detection signal SS.

Fujita, Col. 4, lines 19-27.

As such, Fujita teaches that a press is detected simply by detecting a pressure above a threshold. This is not the same as "outputting a press signal if the velocity is less than a velocity threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed." Thus, the combined references do not teach or suggest each and every element of claim 18. Therefore, claim 18 is patentable over the combined references.

Claim 28 depends from claim 19, which recites "program code for outputting a press signal if the velocity is less than the velocity threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed." Claim 28 is patentable over the combined references for at least the same reasons as claim 18. Applicant respectfully requests the Board reverse the Examiner's rejection of claims 18 and 28.

Issue 5: Whether the Examiner erred in maintaining the rejecting claims 19-23, 26-28, 30, and 32 under 35 U.S.C. § 101 after the Applicant removed the reference to "transmission device" from the specification per the Examiner's request.

In the Final Office Action, the Examiner rejected claims 19-23, 26-28, 30, and 32 under 35 U.S.C. § 101 as allegedly being directed to non-patentable subject matter because the scope of the term "computer-readable media" may encompass a pure signal embodiment. Office Action mailed September 24, 2008, p. 4. Thus, Applicant has deleted reference to 'transmission device' from paragraph 20 to clarify that claims 19-23, 26-28, 30, and 32 do not claim pure signal embodiments. This deletion is only intended to ensure the scope of the term 'computer-readable media' does not cover pure signal embodiments, but does not otherwise indicate any intent to disclaim any other non-pure signal embodiments that 'computer-readable media' may encompass.

In view of the foregoing, Applicant respectfully asserts that claims 19-23, 26-28, 30, and 32 do not include pure signal embodiments within their scope and therefore claim only patentable subject matter. Applicant respectfully requests the Board reverse the Examiner's rejection of claims 19-23, 26-28, 30, and 32 under 35 U.S.C. § 101.

In view of the foregoing, Applicant requests the Board reverse each of the Examiner's rejections of the claims.

Respectfully submitted,

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Appendix A – Claims

1. A method comprising:

receiving a pressure signal indicating a pressure from an input device;

determining a change in pressure based at least in part on the pressure signal;

determining a velocity associated with the pressure signal; and

outputting a press signal if the velocity is less than a velocity threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed.

2. The method of claim 31, wherein the adaptive pressure threshold value is associated with an absolute pressure threshold.

3. The method of claim 31, wherein the adaptive pressure threshold value is associated with a position received from the input device.

4. The method of claim 31, wherein the adaptive pressure threshold value can vary over time.

5. The method of claim 31, wherein the adaptive pressure threshold value is associated with a user identifier.

7. The method of claim 1, wherein the pressure signal comprises a pseudo pressure signal.

8. The method of claim 1, further comprising applying a pressure filter to the pressure signal to create a filtered pressure signal.

9. The method of claim 8, wherein the pressure filter comprises a first pressure filter comprising a first attribute, and further comprising applying a second pressure filter to the pressure signal, the second pressure filter comprising a second attribute that is different than the first attribute.

10. The method of claim 9, wherein the first attribute comprises a first frequency value and the second attribute comprises a second frequency value.

11. The method of claim 10, wherein the second frequency value is lower than the first frequency value.

12. The method of claim 8, wherein applying the pressure filter comprises applying the pressure filter utilizing a sliding window.

13. The method of claim 1, wherein the input device comprises one of a touchpad, a touch panel, and a touch screen.

16. The method of claim 1, wherein the pressure signal comprises a first pressure signal and further comprising:

receiving a second pressure signal indicating a second pressure from the input device;

calculating a difference signal indicative of a difference between the first pressure signal and the second pressure signal;

comparing the difference signal to a difference threshold value; and

outputting the press signal if the difference signal is greater than the difference threshold value.

17. The method of claim 16, further comprising filtering the difference signal to create a filtered difference signal.

18. The method of claim 1, further comprising outputting a signal associated with a haptic effect, the haptic effect based at least in part on the pressure signal.

19. A computer-readable medium on which is encoded programming code, comprising:

program code for receiving a pressure signal indicating a pressure from an input device;

program code for determining a change in pressure based at least in part on the pressure signal;

program code for determining a velocity associated with the pressure signal;

and

program code for outputting a press signal if the velocity is less than the velocity threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed.

21. The computer-readable medium of claim 19, further comprising program code for applying a pressure filter to the pressure signal to create a filtered pressure signal.

22. The computer-readable medium of claim 21, wherein the pressure filter comprises a first pressure filter comprising a first attribute, and further comprising program code for applying a second pressure filter to the pressure signal, wherein the second pressure filter comprises a second attribute that is different than the first attribute.

23. The computer-readable medium of claim 21, wherein program code for applying the pressure filter comprises program code for applying the pressure filter utilizing a sliding window.

26. The computer-readable medium of claim 19, wherein the pressure signal comprises a first pressure signal and further comprising:

program code for receiving a second pressure signal indicating a second pressure from the input device;

program code for calculating a difference signal indicative of a difference between the first pressure signal and the second pressure signal;

program code for comparing the difference signal to a difference threshold value; and

program code for outputting the press signal if the difference signal is greater than the difference threshold value.

27. The computer-readable medium of claim 26, further comprising program code for filtering the difference signal to create a filtered difference signal.

28. The computer-readable medium of claim 19, further comprising program code for outputting a signal associated with a haptic effect, the haptic effect based at least in part on the pressure signal.

29. The method of claim 1, further comprising:

determining a rate of change of pseudo-pressure associated with the pressure signal;

comparing the rate of change of pseudo-pressure with a pseudo-pressure threshold; and

outputting a press signal if the rate of change of pseudo-pressure is greater than the pseudo-pressure threshold

30. The computer-readable medium of claim 19, further comprising:

program code for determining a rate of change of pseudo-pressure associated with the pressure signal;

program code for comparing the rate of change of pseudo-pressure with a pseudo-pressure threshold; and

program code for outputting a press signal if the rate of change of pseudo-pressure is greater than the pseudo-pressure threshold.

31. The method of claim 1, further comprising comparing the pressure signal to an adaptive pressure threshold value, and outputting the press signal if the pressure signal is greater than the adaptive pressure threshold value

32. The computer-readable medium of claim 19, further comprising program code for comparing the pressure signal to an adaptive pressure threshold value, and program code for outputting the press signal if the pressure signal is greater than the adaptive pressure threshold value.

Appendix B – Evidence

None.

Appendix C – Related Proceedings

None.